New York State Integrated Pest Management Program

Title: Evaluation of competition, host type and host location on searching ability and parasitism rates of *Muscidifurax raptorellus* and *Nasonia vitripennis* in New York poultry facilities

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Abstract:

Muscidifurax raptorellus and *Nasonia vitripennis* were examined in experimental arenas and field-release environments to evaluate their individual and paired effectiveness in managing house fly, *Musca domestica*, populations. Laboratory-reared and field-collected pupae were evaluated to determine the impact of host type and host location on parasitism rates.

No significant differences in parasitism rates were observed between lab-reared and field-collected sentinel pupae. Neither parasitoid species was successful in parasitizing pupae buried 2.5 cm under poultry manure within 24 h. When released individually into arenas for 48 h, both species parasitized 6.4% of buried pupae, however, only 3.0% of buried pupae were parasitized when both species were present.

Commercially reared parasitoids were released into three poultry houses; one house received only *N. vitripennis*, the second house received only *M. raptorellus* and the third house received an equal ratio of both species. Most parasitism in the *M. raptorellus* release house was attributed to *N. vitripennis*. This may indicate that *M. raptorellus* is unable to compete in houses with established *N. vitripennis* populations. Additional studies are needed to examine this phenomenon. Therefore, we continue to recommend releases of *M. raptor* and *N. vitripennis* in New York poultry houses.

We observed a depression in parasitism when both *N. vitripennis* and *M. raptorellus* were placed in experimental arenas. However, a similar depression in total parasitism was not detected when releases of the two species were made in the same poultry house. The presence of non-released parasitoids, predominantly *M. raptor* and *Spalangia cameroni*, may have obscured detection of interspecific competition between *N. vitripennis* and *M. raptorellus*.

House fly control was excellent in two of the three houses that received parasitoid releases. The house receiving *N. vitripennis* releases had poor fly control, however, this was predominantly the result of water entering the facility creating large fly breeding areas and not a failure of biological control.

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